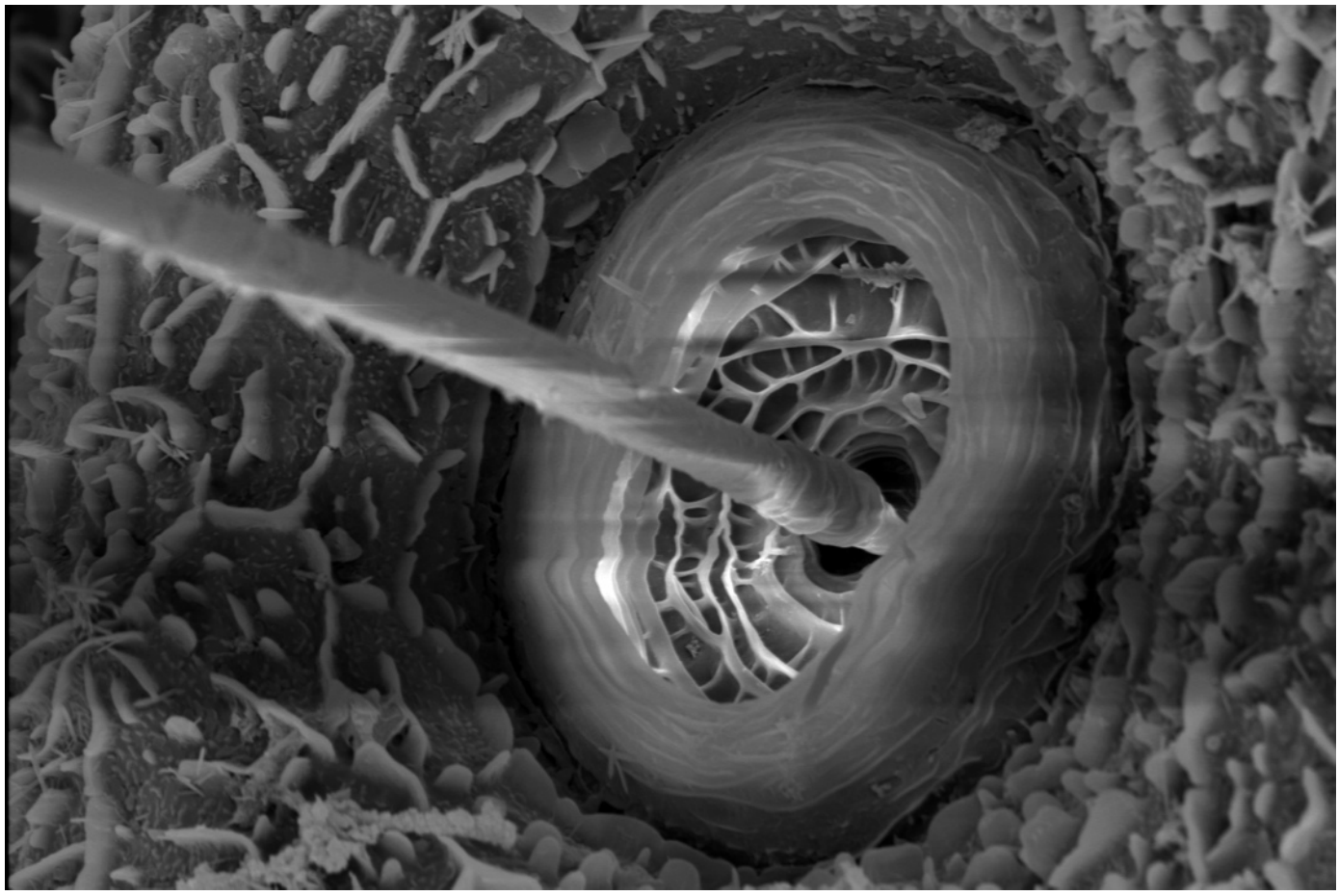
Faunitaxys

Revue de Faunistique, Taxonomie et Systématique morphologique et moléculaire



Volume 14
Numéro 20

Mars 2026

ISSN (Print) : 2269 - 6016
ISSN (Online) : 2970 - 4960
Dépôt légal : Mars 2026

Faunitaxys

Revue de Faunistique, Taxonomie et Systématique morphologique et moléculaire

ZooBank : https://zoobank.org/79A36B2E-F645-4F9A-AE2B-ED32CE6771CC

Directeur de la publication, rédacteur, conception graphique et PAO:
Lionel Delaunay

Cette revue ne peut pas être vendue
Elle est distribuée par échange aux institutions (version papier)
et sur simple demande aux particuliers (format PDF)
à l'adresse suivante:

AFCFF (Association française de Cartographie de la Faune et de la Flore)
28, rue Voltaire, F- 42100 Saint Etienne
E-mail: faunitaxys.journal@gmail.com

Elle est disponible librement au téléchargement à partir du site:

https://faunitaxys.fr/

La parution de *Faunitaxys* est apériodique

Faunitaxys est indexé dans / ***Faunitaxys*** is indexed in:
- Zoological Record
Articles and nomenclatural novelties are referenced by:
- ZooBank (https://zoobank.org)
Online Archives:
- HAL (https://hal.archives-ouvertes.fr)
- Internet Archive (https://archive.org/details/faunitaxys)

Imprimée sur les presses de SPEED COPIE, 6, rue Tréfilerie, F- 42100 Saint-Etienne

Imprimé le 11 03 2026

https://doi.org/10.57800/faunitaxys-14(20)

A synopsis of the trichobothrial patterns observed for Cretaceous amber scorpions. Part I: Buthoidea C. L. Koch, 1837 and related groups

WILSON R. LOURENÇO

Muséum national d'Histoire naturelle, Sorbonne Universités, Institut de Systématique, Evolution, Biodiversité (ISYEB), UMR7205-CNRS, MNHN, UPMC, EPHE, CP 53, 57 rue Cuvier, 75005 Paris, France.
- E-mail : wilson.lourenco@mnhn.fr
- ZooBank : https://zoobank.org/58448BD6-79D7-46CE-AFDD-91EFF2B7D4EF – Orcid : https://orcid.org/0000-0002-2386-363X

Keywords:

Scorpiones;
fossils;
Early Cretaceous;
trichobothrial patterns;
Buthoidea.

Abstract. – Trichobothrial patterns play a major role in the taxonomy of scorpions and had been successfully used, in particular, for the definition of many if not most buthoid groups. Knowledge of trichobothrial patterns in Early Cretaceous fossil scorpions has remained incomplete and, in many respects, unclear. Given the growing number of new taxa described from Cretaceous amber, particularly from Burmite, a first synopsis is here proposed for those belonging to or associated with the buthoids.

Lourenço W. R., 2026. – A synopsis of the trichobothrial patterns observed for Cretaceous amber scorpions. Part I: Buthoidea C. L. Koch, 1837 and related groups. *Faunitaxys*, 14(20): 1 – 12.

DOI: https://doi.org/10.57800/faunitaxys-14(20)

ZooBank: https://zoobank.org/049A6CFE-0E4A-491F-BB1B-CA5E69E484CA

Received: 04/03/2026 – *Revised*: 08/03/2026 – *Accepted*: 09/03/2026

Introduction

Since the earliest descriptions of scorpions preserved in Early Cretaceous amber - from Lebanon, France, and especially Myanmar (Burmite) - characterizing trichobothrial patterns proved fundamental for defining their lineages and assessing their relationships with extant groups (Lourenço, 2001, 2002, 2003). The descriptions published in those early papers, now nearly a quarter of a century old, were based mostly on incomplete specimens that permitted, at best, only fragmentary records of trichobothrial patterns. Subsequently, new discoveries accelerated markedly, especially from 2015 onward (Lourenço, 2015; Lourenço & Beigel, 2015). A preliminary synopsis of all amber scorpions was later proposed (Lourenço, 2023), but it already showed limitations given the growing number of new taxa described in the interim.

The work done since 2001 has revealed several new families and a considerable number of new genera and species. Some of these families proved to be common and speciose, such as Palaeoburmesebuthidae Lourenço, 2015 and Chaerilobuthidae Lourenço & Beigel, 2011 (Lourenço, 2023; Lourenço & Beigel, 2011; Lourenço & Velten, 2024a,b). Others remain rare and enigmatic, such as the members of Palaeotrilineatidae Lourenço, 2012, known from a single genus and species for over ten years (Lourenço, 2012) and only recently represented by a second genus and species (Lourenço & Velten, 2025a). For the more speciose groups, trichobothrial patterns have become progressively better defined - a development that also reflects the improved quality of specimens studied in recent years (Lourenço, 2023).

Given the scattered nature of data accumulated over 25 years of published work, it seemed warranted to propose a series of synopses covering all observed patterns. The present contribution offers a first synopsis for taxa belonging to or associated with the buthoids and related groups.

Historical aspects about the studies on trichobothria and trichobothrial patterns

Likely because of their diminutive size and the consequent difficulty of observation, trichobothria attracted little attention in early scorpion taxonomy. Initial interest came instead from physiologically oriented researchers. The first notable reference is Dahl (1883), who defined trichobothria in Arachnida as 'hearing setae' (Hörhaare in German); the same author (Dahl, 1911) later characterized them more precisely as vibration detectors. This view was reinforced by Hoffmann (1967) and Linsenmair (1968), who studied the structure and function of trichobothria and emphasized their role in the spatial orientation of scorpions.

The use of trichobothria in taxonomy had already been proposed by Dahl (1883, 1906, 1911), but primarily for spiders, a group in which this character proved difficult to apply. Early attempts to employ trichobothria in scorpion taxonomy appeared in contributions by Simon (1879), Dahl (1883), Pocock (1900), Kraepelin (1899, 1908) and Birula (1917), but remained limited largely because no clear nomenclature existed for individual trichobothria. A first attempt at such a nomenclature was made by Kraepelin (1912), who designated trichobothria on the ventral face of the chela-hand as **A** through **F**, though only for a few genera of Chactidae Pocock, 1893, notably *Chactas* Gervais, 1844 and *Teuthraustes* Simon, 1878. A much clearer and more coherent definition was eventually proposed by Vachon (1940), followed by a preliminary nomenclature for the family Buthidae (Vachon, 1948). Many other partial studies followed until the first comprehensive nomenclatural synthesis was provided by Vachon (1974), which remains widely used in scorpion taxonomy today. In parallel, Stahnke (1974) devised an alternative nomenclatural system, but as noted by Sissom (1990), it was not widely adopted. Sissom (1990) also emphasized that trichobothrial numbers and patterns remain among the most useful external

Reviewer: Eric Ythier (*BYG Taxa*, *France*) - ZooBank: https://zoobank.org/06FD0852-A88E-49E5-B8E6-E1494B86C4E1

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.
Copyright 2025. The Authors. *Faunitaxys* published by Lionel Delaunay on behalf of the AFCFF (Association française de Cartographie de la Faune et de la Flore).

characters in scorpion systematics. Following Vachon (1974), subsequent authors contributed additional observations on trichobothrial morphology and function. Hjelle (1990) described trichobothria as long, thin setae arising from a cup-shaped areola not completely filled by the seta base, responding to the slightest air movement. Brownell (2001) characterized them as highly elongated, low-mass hairs (500-1500 µm long, 4-8 µm in diameter) and highlighted their major eco-physiological role. Jeram (2001) noted that trichobothria identical to those of modern scorpions occur in at least one Carboniferous scorpion family, suggesting that functional trichobothria may have been widespread among Palaeozoic scorpions.

Material and methods

The specimens examined were, in most cases, preserved in clear blocks of yellow to reddish-yellow amber. Most pieces were heavily polished and sufficiently thin to permit detailed observation. The schematic drawings provided here represent interpretations of what could be directly observed. Illustrations were produced with a Wild M5 stereomicroscope equipped with a drawing tube (camera lucida) and an ocular micrometre. The general trichobothrial nomenclature and associated notations, including orthobothriotaxy and minorante or majorante neobothriotaxy, follow Vachon (1974). The definitions of patterns Alpha and Beta for buthoid scorpions follow Vachon (1975), and are illustrated in Figures 1-7 and 26-31. For fossil specimens, trichobothria were confidently recorded only when their bothria (areoles) could be clearly observed. In some cases, additional trichobothria were inferred from the presence of transverse hairs (Figs. 32-33).

Trichobothrial patterns observed for the previously studied Early Cretaceous buthoid scorpions

Family 1. **Archaeobuthidae** Lourenço, 2001

Genus 1. ***Archaeobuthus*** Lourenço, 2001.

Type species *Archaeobuthus estephani* Lourenço, 2001.

This is the oldest amber scorpion fossil known. The family, genus and species were described from a single, very incomplete specimen that remains the only one known. The family was associated with the Buthoidea in the original description (Lourenço, 2001), but the trichobothrial pattern was incomplete and could only be tentatively defined as type A-β, probably representing a minorante neobothriotaxy. Trichobothria **e₂** on the femur, **V₂** on the chela-hand and **i** on the fixed finger were clearly absent. Other trichobothria recorded were: on the femur **d₁**, **d₂**, **d₃**, **d₄**, **d₅**, **e₁** and two internal; on the patella **d₁**, **d₂**, **d₃**, **d₅**, **i**, **eb₂**, **est** and **em**; on the chela-hand **Eb₂**, **Eb₃**, **Est**, **Et**; and on the fixed finger **db**, **dt**, **eb**, **esb**, **est** and **et**. To notice that the definition as type A-β was considered as approximative since trichobothria **d₁**, **d₃** and **d₄** were practically in a same line not forming a specific angle, as defined by Vachon (1975).

Soleglad and Fet (2001) subsequently examined trichobothrial elements of the family Archaeobuthidae among other groups, proposing that Archaeobuthidae (cf. *Archaeobuthus*) should be regarded as the plesiomorphic sister group of all extant scorpions, forming a link between the Upper Carboniferous Palaeopisthacanthidae Kjellesvig-Waering, 1986 and recent scorpions. Without formally defining a new trichobothrial type for the Archaeobuthidae, these authors suggested an uncertain Pattern F1. However, the available evidence - a single incomplete specimen of *Archaeobuthus estephani* - does not provide sufficient basis for such broad phylogenetic inferences. Only the discovery of new and better-preserved material from Lebanon amber will allow a more definitive assessment of the taxonomic position of this family.

Family 2. **Ananteridae** Pocock, 1900

Genus 1. ***Archaeoananteroides*** Lourenço, 2016.

Type species *Archaeoananteroides maderai* Lourenço, 2016.

This genus and species were originally assigned to the family Buthidae, but were transferred to Ananteridae following the revalidation of that family. A type A pattern was defined in the description of the first species, although the β disposition of the dorsal trichobothria of the femur was only confirmed with the description of a second species, *Archaeoananteroides carusoi* Lourenço, 2025, nearly ten years after the creation of the genus. The trichobothrial counts confirm the placement of this genus within the Ananteridae: femur with 4 internal, 5 dorsal and 2 external; patella with 1 internal, 5 dorsal, 6-7 external and no ventral; chela-hand with 6 dorso-external and 2 ventral trichobothria; fixed finger with 6 trichobothria (Lourenço & Velten, 2025b).

Family 3. **Buthidae** C. L. Koch, 1837

Genus 1. ***Cretaceousbuthus*** Lourenço, 2022.

Type species *Cretaceousbuthus fraaijeorum* Lourenço, 2022.

This was the second genus assigned to the family Buthidae, and it remains poorly known. A type A pattern was defined in the description of the first species, with a clear β disposition of the dorsal trichobothria of the femur confirmed without ambiguity for the second species described *Cretaceousbuthus petersi* Lourenço, 2023. The genus presents, however, a minorante neobothriotaxy. Femur with 4 internal, 5 dorsal and 2 external; patella with 1 internal, 2 dorsal (with **d₃**, **d₄** and **d₅** absent), 7 external and no ventral. The chela-hand pattern was only confirmed with the description of a second species, *C. petersi* Lourenço, 2023, in which the minorante neobothriotaxy of the patella was confirmed; the chela-hand bears 1-2 dorso-external and 2 ventral trichobothria, and the fixed finger bears 4 (Lourenço & Velten, 2023).

Genus 2. ***Palaeobutheolus*** Lourenço, 2025.

Type species *Palaeobutheolus andreschmidti* Lourenço, 2025 (Fig. 15-20 and 32).

This was the third genus assigned to the family Buthidae, and proved particularly noteworthy among the Burmite fossils. A type A pattern was defined in the description of the first species, with a clear β disposition of the dorsal trichobothria of the femur confirmed without ambiguity for a second species, *Palaeobutheolus staxi* Lourenço, 2025. The genus is unusual in that different segments may present different neobothriotaxic conditions: a majorante neobothriotaxy on the femur and a minorante neobothriotaxy on the patella. Femur with 4 internal, 5 dorsal and 3 external; patella with 1 internal, 4 dorsal (**d₂** absent in one species; **d₂** and **d₃** absent in the second), and 7 external trichobothria, the full complement of which was documented for the first time in this genus; no ventral trichobothria present. The chela-hand pattern was confirmed for the first time as orthobothriotaxic, with 6 dorso-external and 2 ventral trichobothria; the fixed finger is also orthobothriotaxic, with 7 trichobothria including one on the internal face (Lourenço & Velten, 2025c,d).

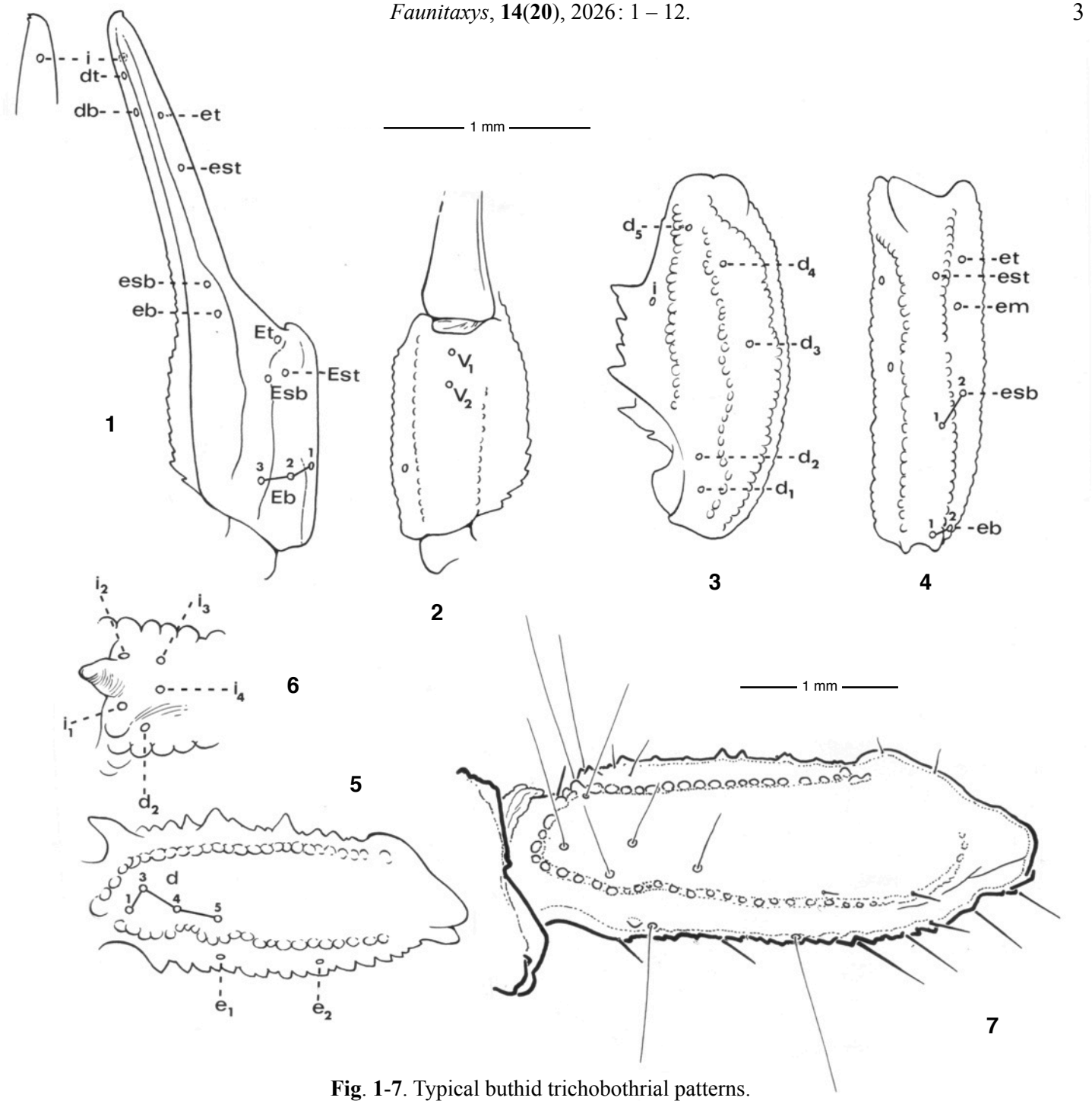


Fig. **1**-**7**. Typical buthid trichobothrial patterns.

1-**6**. *Microtityus vanzolinii* Lourenço & Eickstedt, 1983, female; a type A- α, orthobothriotaxic. **7**. Femur of *Buthus hassanini* Lourenço et al., 2012, female; a type A-β, orthobothriotaxic.

Family 4. **Palaeoburmesebuthidae** Lourenço, 2015

Genus 1. ***Palaeoburmesebuthus*** Lourenço, 2002.

Type species *Palaeoburmesebuthus grimaldii* Lourenço, 2002 (Fig. 8-10).

This is the founding genus of the family Palaeoburmesebuthidae, and the first scorpion of this group to be described from Burmite. The increasing number of species subsequently assigned to this family attests that it is the most speciose group among all scorpions known from Burmite. No trichobothrial pattern could be defined in the original description (Lourenço, 2002) owing to the very incomplete condition of the specimen. Only several years later did better-preserved material allow a clearer definition of the trichobothrial pattern of *Palaeoburmesebuthus*, and also permit the establishment of a second genus, *Betaburmesebuthus* Lourenço, 2015 (Lourenço, 2015; Lourenço & Beigel, 2015).

Studies conducted in 2015 (Lourenço, 2015) established a type A pattern with an α disposition of the dorsal trichobothria of the femur for *Palaeoburmesebuthus*. This pattern was subsequently confirmed for all species described for the genus, although confirmation took several years given that *Palaeoburmesebuthus* proved considerably rarer than *Betaburmesebuthus*. A nearly complete pattern was finally defined in the description of *Palaeoburmesebuthus sarahmeyerae* Lourenço, 2025: femur with 4 internal, 5 dorsal and 2 external; patella with 1 internal, 5 dorsal and 6-7 external; no ventral trichobothria present; chela-hand with 6 dorso-external and 2 ventral; fixed finger with 7 trichobothria, including one on the internal face (Lourenço & Velten, 2025e). The pattern A-α orthobothriotaxic can thus be regarded as the general condition for this genus.

Genus 2. ***Betaburmesebuthus*** Lourenço, 2015.

Type species *Betaburmesebuthus kobberti* Lourenço, 2015 (Fig. 11-14).

The type species of *Betaburmesebuthus* was rather well preserved and allowed the establishment of a type A pattern with a clear β disposition of the dorsal trichobothria of the femur. This pattern was subsequently confirmed without ambiguity for all species described for this genus, including *Betaburmesebuthus groehni* Lourenço, 2025, the most recently described species (Lourenço & Velten, 2025f). Femur with 4 internal, 5 dorsal and 2 external; patella with 1 internal, 4 dorsal and 6-7 external trichobothria; no ventral trichobothria present; chela-hand with 6 dorso-external and 2 ventral; fixed finger with 7 trichobothria, including one on the internal face (Lourenço & Velten, 2025f). The orthobothriotaxic condition for the external face of the patella, with seven trichobothria, was however only confirmed through recent observation of a second specimen of *Betaburmesebuthus larafleissnerae* Lourenço, 2016 (Figs. 11-14).

Genus 3. ***Spinoburmesebuthus*** Lourenço, 2017.

Type species *Spinoburmesebuthus pohli* Lourenço, 2017.

The type species of *Spinoburmesebuthus* was reasonably well preserved and allowed the establishment of a type A pattern with a β disposition of the dorsal trichobothria of the femur. This pattern was confirmed for the second species described, *Spinoburmesebuthus knodelorum* Lourenço, 2021. Femur with 4 internal, 5 dorsal and 2 external; patella with 1 internal, 5 dorsal and 7 external trichobothria; no ventral trichobothria present; chela-hand with 6 dorso-external and 2 ventral; fixed finger with 7 trichobothria, including one on the internal face (Lourenço, 2021). The orthobothriotaxic pattern can thus be firmly established for this genus.

Genus 4. ***Paranotaburmesebuthus*** Lourenço, 2024.

Type species *Paranotaburmesebuthus schmidti* Lourenço, 2024 (Fig. 33).

The type species of this genus was quite well preserved and allowed the establishment of a type A pattern with an α disposition of the dorsal trichobothria of the femur; the genus remains monotypic. Femur with 4 internal, 5 dorsal and 2 external; patella with 1 internal, 5 dorsal and 6-7 external trichobothria; no ventral trichobothria present; chela-hand with 5-6 dorso-external and 2 ventral; fixed finger with 6 trichobothria, although the internal trichobothrium was not clearly observed (Lourenço & Velten, 2024c). An orthobothriotaxic pattern can be strongly suggested for this genus, pending confirmation from additional specimens.

Family 5. **Palaeotrilineatidae** Lourenço, 2012

Since its original establishment (Lourenço, 2012), this family has attracted debate given that its general morphology strongly resembled that of buthoid taxa, while its trichobothrial pattern was quite unique.

As discussed in a previous paper (Lourenço & Velten, 2025a), the decision to establish the family Palaeotrilineatidae was based primarily on the trichobothrial pattern of *Palaeotrilineatus ellenbergeri* Lourenço, 2012, type species of both the genus and the family. The observed pattern suggested affinities with three extant families or lineages: buthoids, chaeriloids and pseudochactids. At the time of the family's creation it was stated: "According to some of the visible characters originally observed, particularly the trichobothrial pattern, the new scorpion seems to be allied to buthoids, chaeriloids and pseudochactids. These three lineages are today represented in Southeast Asia. Even so, the assignment of the new family to one of the superfamilies, Buthoidea or Chaeriloidea (Lourenço, 2000), remains difficult. This is due to the incompleteness of the data currently available about these Burmese amber scorpions." In fact, *Palaeotrilineatus ellenbergeri* presented several characteristics that could lead to its association with the buthoids. Nevertheless, the trichobothrial pattern observed, which can be defined as a majorante neobothriotaxy, tends to argue against a straightforward association.

Nevertheless, with the description of a second genus and species within this family, a number of characters were confirmed and additional ones illustrated. It therefore seemed more appropriate, at least provisionally, to include this family within the superfamily Buthoidea C. L. Koch, 1837. The family Palaeotrilineatidae Lourenço, 2012 currently comprises two genera and two species.

Genus 1. ***Palaeotrilineatus*** Lourenço, 2012.

Type species *Palaeotrilineatus ellenbergeri* Lourenço, 2012 (Fig. 21-25).

Observed trichobothria: femur with 1 internal, 3-6 dorsal and 3 external; patella with 1 internal, 3-4 dorsal, 3-4 ventral and 9-10 external (some of the ventral trichobothria may represent displaced trichobothria from the external face); chela-hand with 5-7 dorso-external and 3 ventral; fixed finger with 5 trichobothria.

Genus 2. ***Paratrilineatus*** Lourenço, 2025.

Type species *Paratrilineatus schmidti* Lourenço, 2025.

Observed trichobothria: femur with 2-3 internal, 3-4 dorsal and 3 external; patella with 1 internal, 4-5 dorsal, 1-2 ventral and 8-9 external (some of the ventral trichobothria may represent displaced trichobothria from the external face); chela-hand with 4-5 dorso-external and 3 ventral; fixed finger with 6 trichobothria.

Discussion

The decision to erect the family Palaeotrilineatidae was based primarily on the trichobothrial patterns of *Palaeotrilineatus ellenbergeri* and subsequently of *Paratrilineatus schmidti*, since both species apparently combine characters similar to those observed in buthids, chaerilids and pseudochactids, corresponding to pattern types A, B and D respectively (Vachon, 1974; Soleglad & Fet, 2001, 2003). This combination led to the assignment of the family to a type G pattern, which nonetheless remains associated with the classical type A. The majorante neobothriotaxy observed in both genera, however, complicates a straightforward assignment to any of these lineages.

These three lineages, buthids, chaerilids and pseudochactids are today represented in Southeast Asia by extant forms. Even so, the assignment of the Palaeotrilineatidae to one of the superfamilies, Buthoidea or Chaeriloidea (Lourenço, 2000, 2012; Lourenço & Velten, 2025a), remains problematic. Naturally, this is due to the incompleteness of the data currently available for this group of Burmese amber scorpions, which remain rare, probably due to their global large sizes, what renders more aleatory their capture in the resins. Yet both species of Palaeotrilineatidae exhibit additional characters, beyond trichobothrial patterns, that support their association with the buthoids.

As defined by Vachon (1974), buthids present a type A trichobothrial pattern, which appears to be the simplest and most stable among those defined for the various scorpion families. Given the regularity of trichobothrial counts in this group, type A is predominantly characterized as orthobothriotaxic (Vachon, 1974; Soleglad & Fet, 2001), meaning that most generic groups and species show a stable

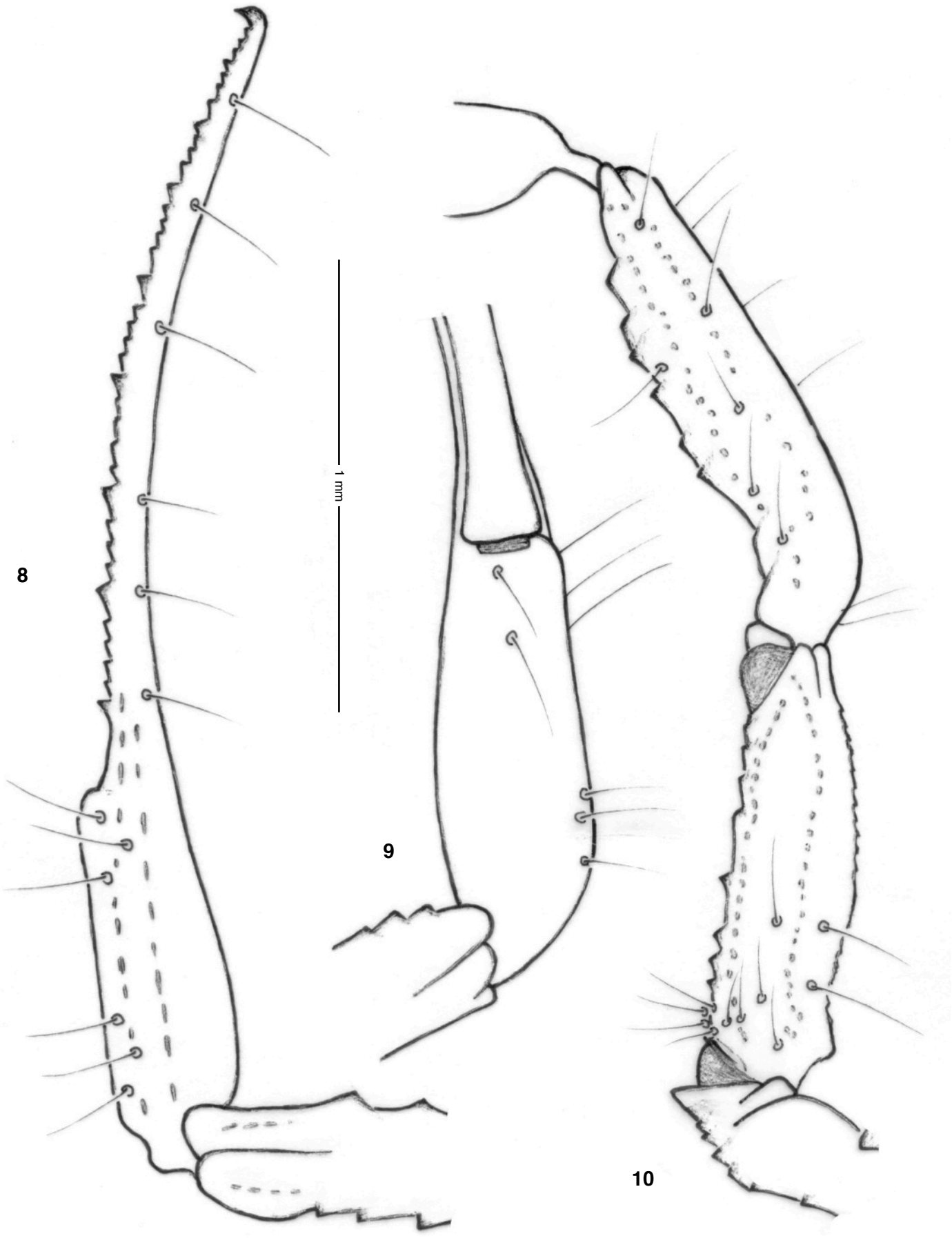


Fig. **8-10**. Trichobothrial pattern of *Palaeoburmesebuthus sarahmeyerae* Lourenço, 2025, male.
8-9. Chela, dorso-external and ventral aspects. **10**. Femur and patella, dorsal aspect.

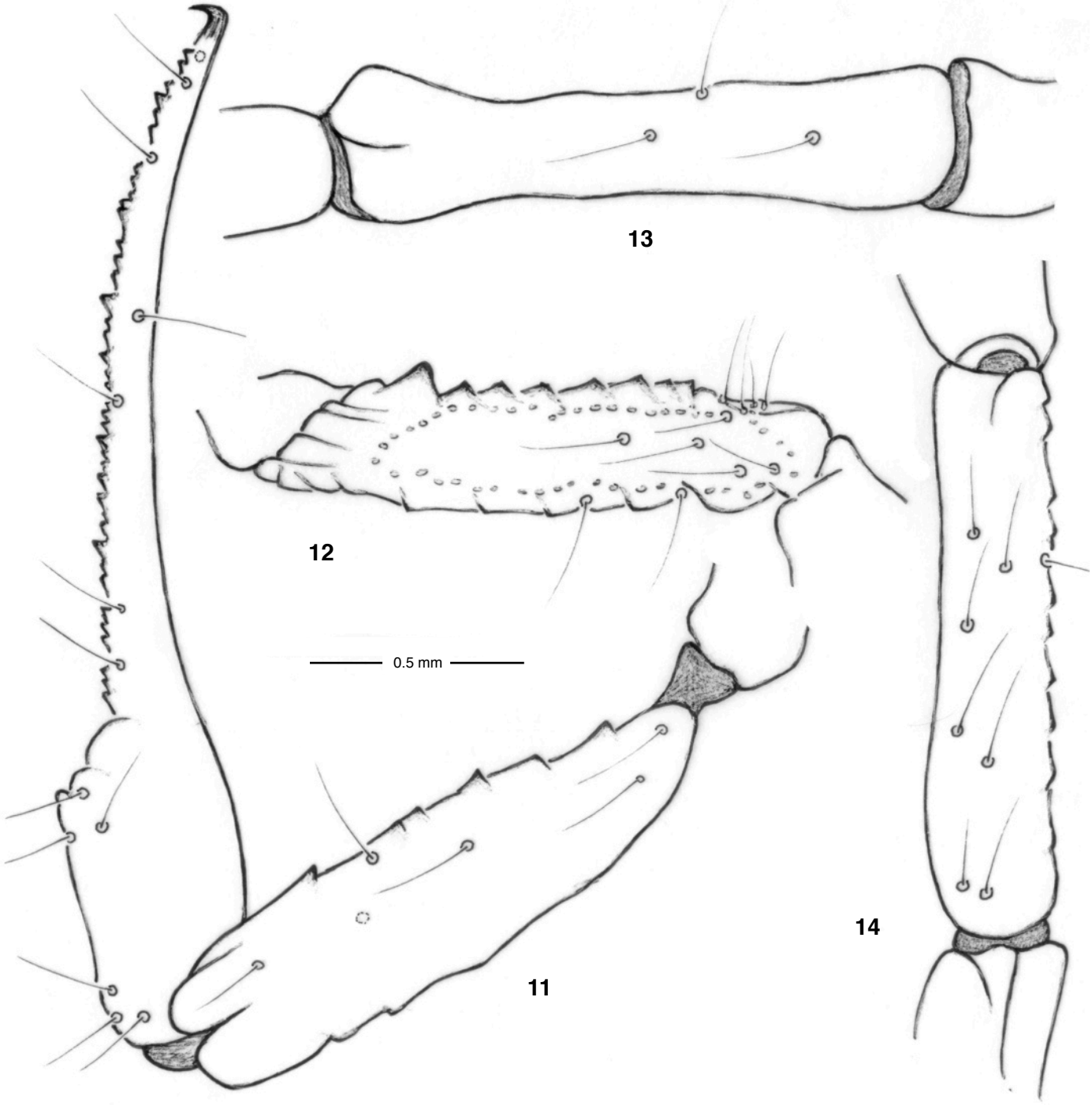


Fig. **11-14**. Trichobothrial pattern of *Betaburmesebuthus larafleissnerae* Lourenço, 2016, female. The pattern confirms a type A-β, orthobothriotaxic.

11. Chela and patella, dorso-external aspects. **12-13**. Femur, dorsal and external aspects. **14**. Patella, external aspect.

number of fundamental trichobothria, with only a few exceptions involving majorante or minorante neobothriotaxies. It should be noted that most of the definitions proposed by Vachon (1974) should be regarded as a conventional framework rather than a direct reflection of evolutionary pathways (Soleglad & Fet, 2001).

In other words, if the analysis is limited to buthids, the most frequently observed pattern is the standard one. One question that arises concerns the fossil lineages of the Cretaceous period. If attention is restricted to lineages associated with the buthoids, such as *Archaeoananteroides* Lourenço, 2016 and *Cretaceousbuthus* Lourenço, 2022, which can clearly be referred to the families Ananteridae Pocock, 1900 and Buthidae C. L. Koch, 1837, or those belonging to the family Palaeoburmesebuthidae (Lourenço, 2023), including the genera *Palaeoburmesebuthus* Lourenço, 2002, *Betaburmesebuthus* Lourenço, 2015, *Spinoburmesebuthus* Lourenço, 2017 and *Paranotaburmesebuthus* Lourenço, 2024, it becomes clear that the trichobothrial patterns observed are very similar or even identical to type A as defined by Vachon (1974). This confirms that the type A model was already established during the Mesozoic.

Other divergent models were certainly also present, differing markedly from the typical type A. Such divergences can still be observed in a number of extant groups, such as the genera *Buthiscus* Birula, 1905, *Liobuthus* Birula, 1898 and *Vachoniolus* Levy, Amitai & Shulov, 1973, which present a majorante neobothriotaxy, and *Orthochirus* Karsch, 1891, with a minorante neobothriotaxy (Vachon, 1958, 1974; Levy et al., 1973; Lourenço & Leguin, 2011; Ythier & Lourenço, 2023). It is also worth noting that another family described from Cretaceous amber, Archaeobuthidae Lourenço, 2001, presents a typical neobothriotaxy but was clearly associated with the buthoids (Lourenço, 2001). Taking all these observations

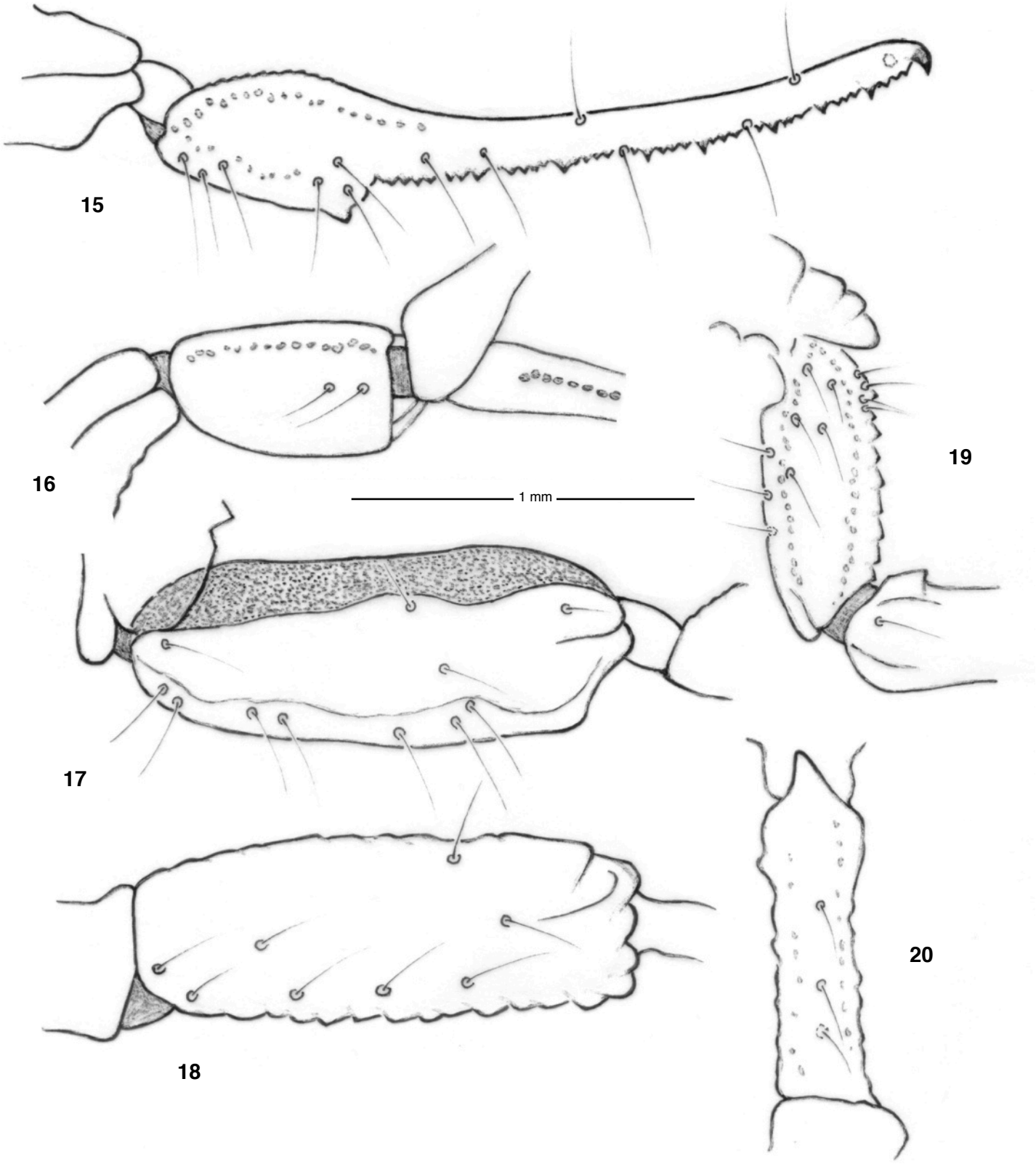


Fig. **15-20**. Trichobothrial pattern of *Palaeobutheolus staxi* Lourenço, 2025, male. The pattern confirms a type A-β, majorante neobothriotaxic for the femur and minorante neobothriotaxic for the patella.

15-16. Chela, dorso-external and ventral aspects. **17-18**. Patella, dorso-external and external aspects. **19-20**. Femur, dorsal and external aspects.

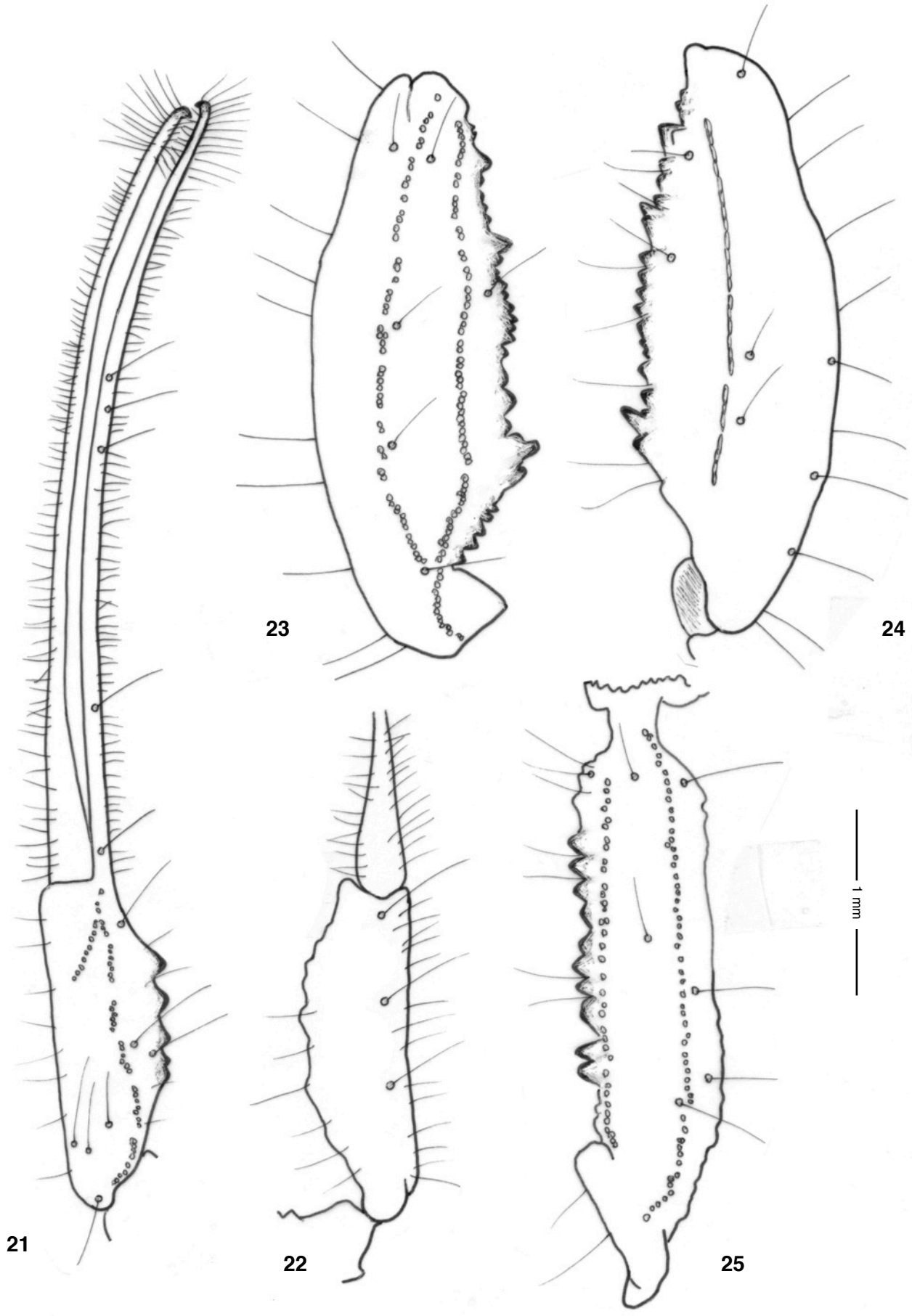


Fig. **21**-**25**. Trichobothrial pattern of *Palaeotrilineatus ellenbergeri* Lourenço, 2012, male. The observed pattern is quite unique; resembles somewhat the type A, but has divergences.

21-**22**. Chela, dorso-external and ventral aspects. **23**-**24**. Patella, dorsal and ventral aspects. **25**. Femur, dorsal aspect.

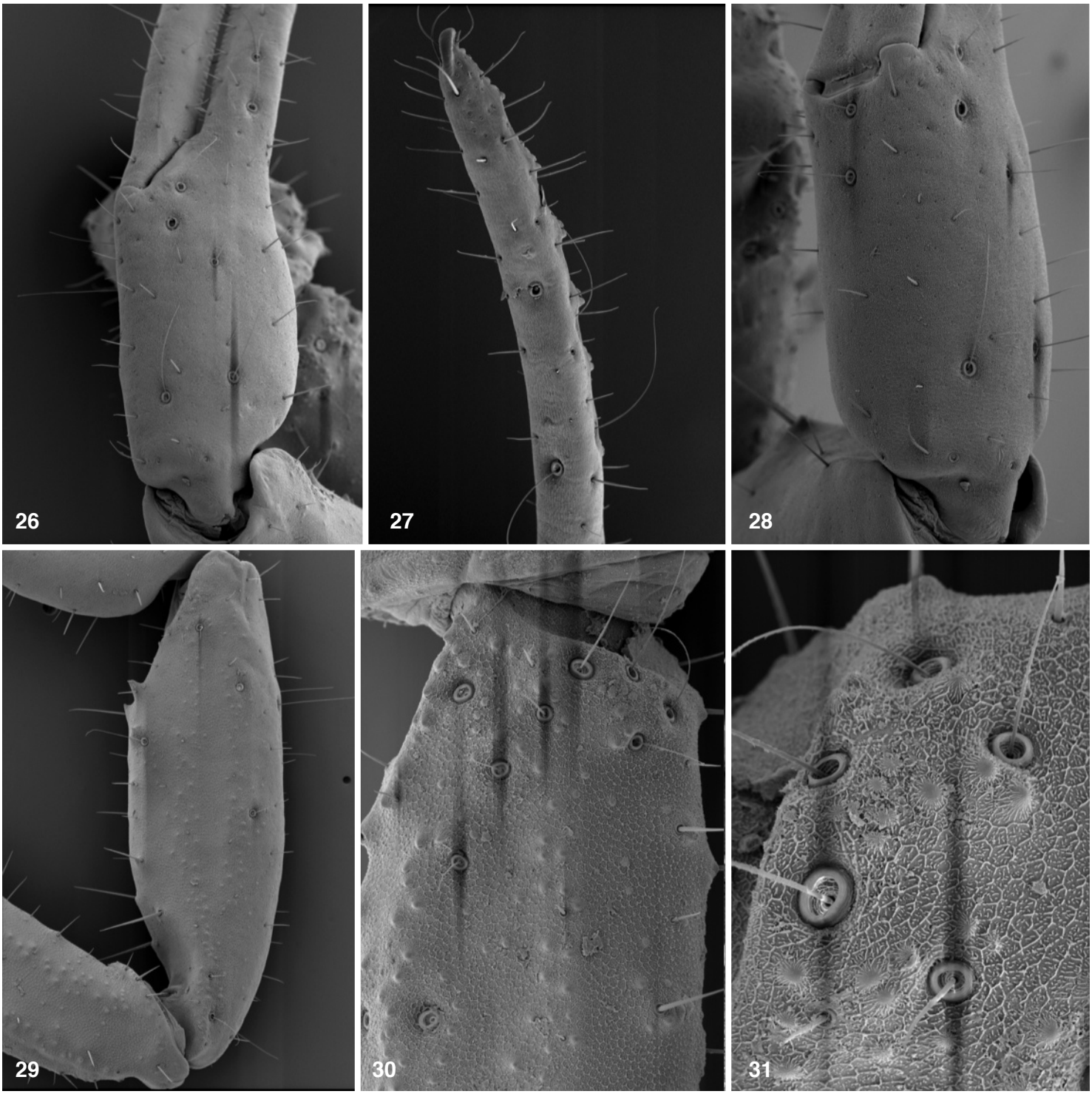


Fig. **26-31**. SEM photos of the trichobothrial pattern presented by the scorpion *Microcharmus fisheri* Lourenço, 1998, family Microcharmidae. This family can be considered in a basal position within the buthoids; a type A-α, orthobothriotaxic can be observed.

26. Chela-hand, dorso-external aspect (x 95). **27**. Fixed finger, dorso-external aspect (x 100). **28**. Chela-hand, ventro-external aspect (x 130). **29**. Patella, dorsal aspect (x 65). **30-31**. Femur, dorso-internal and internal aspects (x 170 and 450).

together, and in particular the confirmation of several buthoid characters in both genera of the family Palaeotrilineatidae, it seems reasonable to include this family within the superfamily Buthoidea C. L. Koch, 1837.

The overall results for the majority of families considered here tend to confirm that taxa clearly associated with the buthoid lineage were already present during the Early Cretaceous. The picture assembled in this synopsis can be considered quite satisfactory, though not yet complete. It is reasonable to expect that the discovery and study of an increasing number of new taxa, particularly from Burmite, will lead to more precise conclusions.

Conclusions

This synopsis assembles, for the first time, trichobothrial data scattered across 25 years of publications on Early Cretaceous amber scorpions belonging to or associated with the Buthoidea. The results confirm that taxa presenting trichobothrial patterns very similar or identical to the modern type A were already established during the Mesozoic, attesting to the remarkable stability of this character complex through geological time. At the same time, divergent patterns documented in families such as Palaeotrilineatidae demonstrate that variation in trichobothrial organization was also

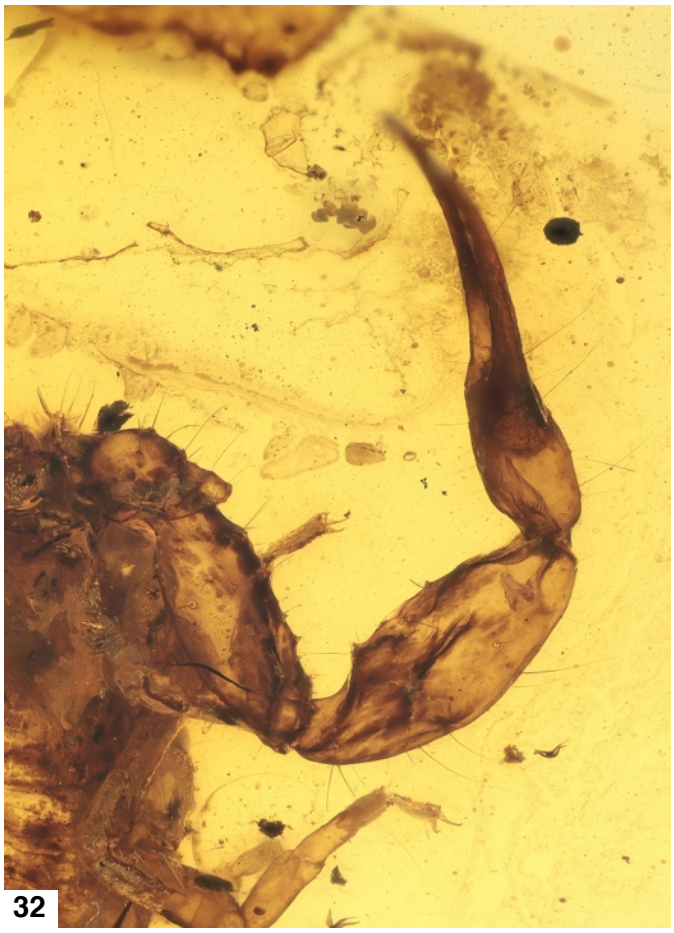


Fig. **32-33**. Pedipalps of Burmite fossil scorpions, showing different trichobothria which can be easily observed.
32. *Palaeobutheolus andreschmidti* Lourenço, 2025, male. **33**. *Paranotaburmesebuthus schmidti* Lourenço, 2024, male.

present in Cretaceous buthoid lineages, as it remains among certain extant genera today.

The present synopsis should be regarded as a working framework rather than a definitive account. The growing rate of new discoveries, particularly from Burmite, makes it reasonable to expect that future material will refine and expand the picture presented here. The quality and completeness of trichobothrial data in future descriptions will be critical to the progress of this field, as precise documentation of bothria and areoles remains the foundation of any meaningful comparative analysis.

Acknowledgements

I am most grateful to my great friend and colleague Professor Adriano Kury of the Museu Nacional, Rio de Janeiro, Brazil, for very useful comments to the manuscript

References

Birula A. A., 1917. – Faune de la Russie et des pays limitrophes fondee principalement sur les collections du Musée zoologique de l'Académie des sciences de Russie. Arachnides (Arachnoidea). 1 (1): xx+227 pp. (in Russian; preface dated October 1917. English translation: Fauna of Russia and adjacent countries). *Arachnoidea*. Vol. I. Scorpions. Israel Program for Scientific Translations, Jerusalem, 19 : 154 pp.

Brownell P., 2001. – Sensory ecology and orientational behaviors. Pp. 159-183. In: P. Brownell & G. Polis (ed.), *Scorpion biology and research*. Oxford University Press, 431 p.

Dahl F., 1883. – Über die Hörhaare bei den Arachnoiden. *Zoologischer Anzeiger*, 129-156: 267-270.

Dahl F., 1906. – Die gestreckte Körperform bei Spinnen und das System der Araneen. *Zoologischer Anzeiger*, 31 (2-3): 60-64.

Dahl F., 1911. – Die Hörhaare (Trichobothrien) und das System der Spinnentiere. *Zoologischer Anzeiger*, 37 (25): 522-532.

Hjelle J. T., 1990. – Anatomy and morphology. Pp. 9-63. In: G. A. Polis (ed.), *The Biology of Scorpions*. Stanford University Press, 587 p.

Hoffmann C., 1967. – Bau und Fonktion der Trichobothrien von *Euscorpius carpathicus* L. *Zeitschrift für Vergleichende Physiologie*, 54 : 290-325.

Jeram A. J., 2001. – Paleontology. Pp. 370-392. In: P. Brownell & G. Polis (ed.), *Scorpion biology and research*. Oxford University Press, 431 p.

Kraepelin K., 1899. – Scorpiones und Pedipalpi. In: F. Dahl (Ed.). Das Tierreich. Herausgegeben von der Deutschen zoologischen Gesellschaft. Berlin, R. Friedländer und Sohn Verlag, 8 (Arachnoidea): 1-265.

Kraepelin K., 1908. – Scorpiones. In: Michaelsen, W. & T. R. Hartmeyer (Eds.). Die Fauna Südwest-Australiens. *Ergebnisse*

der Hamburger südwest-australischen Forschungsreise 1905. G. Fischer, Jena, 2 (7): 87-104.

Kraepelin K., 1912. – Neue Beiträge zur Systematik der Gliederspinnen. II. Chactinae (Scorpiones). *Mitteilungen aus dem Naturhistorischen Museum* (2. Beiheft zum Jahrbuch der Hamburgischen wissenschaftlichen Anstalten, 1911), 29 (2): 43-88.

Levy G., Amitai P. & Shulov A., 1973. – New scorpions from Israel, Jordan and Arabia. *Zoological Journal of the Linnean Society*, 52(2): 113-140.

Linsenmair K. E., 1968. – Anemomenotaktische Orienterung bei Scorpionen (Chelicerata, Scorpiones). *Zeitschrift für Vergleichende Physiologie*, 60: 445-449.

Lourenço W. R., 2000. – Panbiogéographie, les familles des scorpions et leur répartition géographique. *Biogeographica*, 76 (1): 21-39.

Lourenço W. R., 2001. – A remarkable scorpion fossil from Lebanon amber. Implications for the phylogeny of Buthoidea. *Comptes Rendus de l'Académie des Sciences, Paris, Sciences de la Terre et des planètes*, 332: 641-646.

Lourenço W. R., 2002. – The first scorpion fossil from the Cretaceous amber of Myanmar (Burma). New implications for the phylogeny of Buthoidea. *Comptes Rendus Palevol*. Paris1: 97-101.

Lourenço W. R., 2003. – The first scorpion fossil from the Cretaceous amber of France. New implications for the phylogeny of Chactoidea. *Comptes Rendus Palevol*. Paris, 2: 213-219.

Lourenço W. R., 2012. – About the scorpion fossils from the Cretaceous amber of Myanmar (Burma) with the descriptions of a new family, genus and species. *Acta biologica Paranaense*, Curitiba, 41 (3-4): 75-87.

Lourenço W. R., 2015. – Clarification of the familial status of the genus *Palaeoburmesebuthus* Lourenço, 2002 from Cretaceous Burmese amber (Scorpiones: Archaeobuthidae: Palaeoburmesebuthinae). *Beiträge zur Araneologie*, 9: 465-475.

Lourenço W. R., 2021. – Further comments on the elements of the family Palaeoburmesebuthidae Lourenço, 2015 with description of a new species of *Spinoburmesebuthus* Lourenço, 2017 from Early Cretaceous Burmite amber (Scorpiones). *Faunitaxyx*, 9 (17): 1-6.

Lourenço W. R., 2023. – Scorpions trapped in amber: a remarkable window on their evolution over time from Mesozoic period to present days. *Journal of Venomous Animals and Toxins including Tropical diseases*: 1-15 +Addendum: Commented checklist of the known amber scorpion species: 1-9. https://doi.org/10.1590/1678-9199-JVATITD-2023-0040

Lourenço W. R. & Beigel A., 2011. – A new scorpion fossil from the Cretaceous amber of Myanmar (Burma). New phylogenetic implications. *Comptes Rendus Palevol*, 10: 635-639.

Lourenço W. R. & Beigel A., 2015. – A new genus and species of Palaeoburmesebuthinae Lourenço, 2014 (Scorpiones: Archaeobuthidae:) from Cretaceous amber of Myanmar. *Beiträge zur Araneologie*, 9: 476-480.

Lourenço W. R. & Leguin E.-A., 2011. – Further considerations on the species of the genus *Orthochirus* Karsch, 1891 from Africa, with description of three new species (Scorpiones: Buthidae). *Euscorpius*, 116: 1-19.

Lourenço W. R. & Velten J., 2023. – Confirmation of the validity of the genus *Cretaceousbuthus* Lourenço, 2022 and description of a new species from Burmite (Scorpiones: Buthoidea: Buthidae). *Faunitaxys*, 11 (35): 1-6.

Lourenço W. R. & Velten J., 2024a. – An unusual new species of *Betaburmesebuthus* Lourenço, 2015 trapped in Burmite (Scorpiones: Palaeoburmesebuthidae). *Faunitaxys*, 12 (26): 1-5.

Lourenço W. R. & Velten J., 2024b. – The remarkable diversity of the genus *Chaerilobuthus* Lourenço & Beigel, 2011 with the description of one more new species (Scorpiones: Chaerilobuthidae). *Faunytaxis*, 12 (56): 1-5.

Lourenço W. R. & Velten J., 2024c. – An exceptional new genus of fossil scorpion from Burmese Cretaceous amber belonging to the family Palaeoburmesebuthidae Lourenço, 2015. *Faunitaxys*, 12 (13): 1-7.

Lourenço W. R. & Velten J., 2025a. – New considerations on the taxonomic status of the family Palaeotrilineatidae Lourenço, 2012 and description of a new genus and new species (Scorpiones: Buthoidea). *Faunitaxys*, 13 (25): 1-6.

Lourenço W. R. & Velten J., 2025b. – A new species for the genus *Archaeoananteroides* Lourenço, 2016, fossil scorpion from Burmite (Scorpiones: Buthoidea: Ananteridae). *Faunitaxys*, 13 (3): 1-6.

Lourenço W. R. & Velten J., 2025c. – One more remarkable new genus and species of fossil scorpion from Burmese Cretaceous amber associated to the extant family Buthidae (Scorpiones: Buthoidea). *Faunitaxys*, 13 (35): 1-6.

Lourenço W. R. & Velten J., 2025d. – A second species for the remarkable genus *Palaeobutheolus* Lourenço, 2025 from Burmese Cretaceous amber, and confirmation of its association to the extant family Buthidae (Scorpiones: Buthoidea). *Faunitaxys*, 13 (58): 1-5.

Lourenço W. R. & Velten J., 2025e. – A particular new species for the genus *Palaeoburmesebuthus* Lourenço, 2002 from Burmite (Scorpiones: Palaeoburmesebuthidae). *Faunitaxys*, 13 (37): 1-5.

Lourenço W. R. & Velten J., 2025f. – One more new species of *Betaburmesebuthus* Lourenço, 2015 trapped in Burmite (Scorpiones: Palaeoburmesebuthidae). *Faunitaxys*, 13 (57): 1-4.

Pocock R. I., 1900. – Arachnida. The Fauna of British India, including Ceylon and Burma. Published under the authority of the Secretary of State for India in Council. Edited by W. T. Blandford, London. XII : 279 pp.

Simon E., 1879. – 3e Ordre. - Scorpiones. Pp. 79-115. In: Les Arachnides de France. VII. Contenant les Ordres des Chernetes, Scorpiones et Opiliones. Roret, Paris, 332 pp.

Sissom W. D., 1990. – Systematics, Biogeography, and Paleontology. Pp. 64-160. In: G. A. Polis (ed.), *The Biology of Scorpions*. Stanford University Press, 587 p.

Soleglad M. E. & Fet V., 2001. – Evolution of scorpion orthobothriotaxy: a cladistic approach. *Euscorpius*, 1: 1-38.

Soleglad M. E. & Fet V., 2003. – High-level systematics and phylogeny of the extant scorpions (Scorpiones: Orthosterni). *Euscorpius*, 11: 1-175.

Stahnke H. L., 1974. – Revision and keys to the higher categories of Vejovidae. *Journal of Arachnology*, 1: 107-141.

Vachon M., 1940. – Sur la systématique des Scorpions. *Mémoires du Muséum national d'histoire naturelle*, Paris, 13 (2): 241-260.

Vachon M., 1948. – Etude sur les scorpions. *Archives de l'Institut Pasteur d'Algérie*, 26 (1) : 25-90.

Vachon M., 1958. – A propos de *Liobuthus kessleri* Birula, Scorpion psammophile nouveau pour la faune iranienne.

Bulletin du Muséum national d'histoire naturelle, Paris, 2e sér., 30 : 422-426.

Vachon M., 1974. – Etude des caractères utilisés pour classer les familles et les genres de Scorpions (Arachnides). 1. La trichobothriotaxie en arachnologie. Sigles trichobothriaux et types de trichobothriotaxie chez les Scorpions. *Bulletin du Muséum national d'Histoire naturelle*, Paris 3e sér., 140, 857-958.

Vachon M., 1975. – Sur l'utilisation de la trichobothriotaxie du bras des pédipalpes des Scorpions (Arachnides) dans le classement des genres de la famille des Buthidae Simon. *Comptes Rendus des Séances de l'Académie des Sciences*, 281 (D): 1597-1599.

Ythier E. & Lourenço W. R., 2023. – A new species of *Buthiscus* Birula, 1905 (Scorpiones: Buthidae) from the Adrar des Ifoghas, Mali. *Faunitaxys*, 11 (22): 1-7.

Author's contribution

Publisher Correspondence. – WL
Writing the article. – WL
Description. – WL
Article proofreading. – WL
Bibliographic work. – WL
Material study. – WL
Author of the figures. – WL (1-31)

WL = Wilson R. Lourenço

Résumé

Lourenço W. R., 2026. – Un synopsis des modèles trichobothriaux observés chez les scorpions fossiles du Crétacé inférieur. Part I : Les Buthoidea C. L. Koch, 1837 et les groupes associés. *Faunitaxys*, 14(20): 1 – 12.

Les modèles trichobothriaux ont une importance majeure dans la taxonomie des scorpions et ont été utilisés avec succès notamment dans la définition d'une majorité de groupes associés aux Buthoidea. Les connaissances sur les modèles trichobothriaux observés pour les fossiles du Crétacé inférieur demeurent jusqu'à présent assez incomplètes voir même confuses. Compte-tenu du nombre croissant de nouveaux éléments récemment décrits de l'ambre du Crétacé, en particulier ceux de l'ambre Crétacé de Myanmar, un premier synopsis est proposé pour les éléments appartenant ou associés aux Buthoidea.

Mots-clés. – Scorpiones, fossiles, Crétacé inférieur, modèles trichobothriaux, Buthoidea.

Derniers articles publiés

Barria M.D. & Franco-Salgado J., 2025. – Nueva especie Sudamericana de *Phyllophaga* (*Phytalus*) (Coleoptera: Scarabaeoidea: Scarabaeidae: Melolonthinae: Rhizotrogini) del nororiente de Ecuador. *Faunitaxys*, 13(50): 1 – 6. https://doi.org/10.57800/faunitaxys-13(50)

Dheurle C., 2025. – Description d'une nouvelle espèce du genre *Neocollyris* Horn, 1901 des Philippines (Coleoptera Cicindelidae). *Faunitaxys*, 13(51): 1 – 3. https://doi.org/10.57800/faunitaxys-13(51)

Qi Z.-H., Bian C.-Z., Xin F.-Y., Dang V. N., Song H.-T. & Liang G.-H., 2025. – A new subspecies of *Dorcus linwenhsini* Huang & Chen, 2013 from Northern Vietnam (Coleoptera: Lucanidae: Lucaninae). *Faunitaxys*, 13(52): 1 – 10. https://doi.org/10.57800/faunitaxys-13(52)

Xin F.-Y., Zhong X.-T. & Qi Z.-H., 2025. – Revealing a new subspecies of *Lucanus sericeus* Didier, 1925 (Coleoptera: Lucanidae) based on morphological comparison. *Faunitaxys*, 13(53): 1 – 13. https://doi.org/10.57800/faunitaxys-13(53)

Lin J.-Z., 2025. – Contribution to the taxonomic knowledge of the genus *Aesalus* Fabricius, 1801 (Coleoptera: Lucanidae), with description of a new species from Northern Taiwan. *Faunitaxys*, 13(54): 1 – 7. https://doi.org/10.57800/faunitaxys-13(54)

Sherwood D., Peyton J., Cairns-Wicks R., Fowler L., Geci D. & Balchin J., 2025. – Just the two of us: presence of a second species of non-native gecko of the genus *Hemidactylus* Goldfuss, 1820 (Squamata: Gekkonidae) confirmed on Saint Helena. *Faunitaxys*, 13(55): 1 – 5. https://doi.org/10.57800/faunitaxys-13(55)

Vives E., 2025. – Descripción de una nueva especie del genero *Mimocornuscoparia* Breuning, 1970, (Coleoptera, Cerambycidae, Lamiinae), procedente de Sulawesi, Indonesia. *Faunitaxys*, 13(56) : 1 – 3. https://doi.org/10.57800/faunitaxys-13(56)

Lourenço W. R. & Velten J., 2025. – One more new species of *Betaburmesebuthus* Lourenço, 2015 trapped in Burmite (Scorpiones: Palaeoburmesebuthidae). *Faunitaxys*, 13(57): 1 – 4. https://doi.org/10.57800/faunitaxys-13(57)

Lourenço W. R. & Velten J., 2025. – A second species for the remarkable genus *Palaeobutheolus* Lourenço, 2025 from Burmese Cretaceous amber, and confirmation of its association to the extant family Buthidae (Scorpiones: Buthoidea). *Faunitaxys*, 13(58): 1 – 5. https://doi.org/10.57800/faunitaxys-13(58)

Lapèze J., 2025. – Four new species of spittlebugs from French Guiana of the genus *Maxantonia* and *Catrimania* (Hemiptera: Cercopoidea: Ischnorhinidae). *Faunitaxys*, 13(59) : 1 – 16. https://doi.org/10.57800/faunitaxys-13(59)

Santos-Silva A., Bezark L. G. & Pérez-Flores O., 2025. – Cerambycidae (Coleoptera) from the James Cope collection. Part II: new species and new geographical records. *Faunitaxys*, 13(60) : 1 – 20. https://doi.org/10.57800/faunitaxys-13(60)

Lourenço W. R. & Velten J., 2025. – The remarkable variability of the genus *Betaburmesebuthus* Lourenço, 2015 from Burmite; comments on newly confirmed morphological characters and description of a new species (Scorpiones: Palaeoburmesebuthidae). *Faunitaxys*, 13(61): 1 – 7. https://doi.org/10.57800/faunitaxys-13(61)

Háva J., Konvička O., Bobot L. & Brustel H., 2025. – A new *Entoxylon* Ancey, 1869 species from Spain (Coleoptera: Mycetophagidae: Esarcinae). *Faunitaxys*, 13(62): 1 – 8. https://doi.org/10.57800/faunitaxys-13(62)

Cerda J.-A., 2025. – Ctenuchina de Guyane française (2de partie). Les genres *Ptychotricos* - *Delphyre* - *Druceius* - *Aderithales* - *Moeschlerius* - *Hyaleucerea* - *Nitoris* & *Fraudulentus* (2d article). 18e note. *Faunitaxys*, 13(63) : 1 – 17. https://doi.org/10.57800/faunitaxys-13(63)

Fleck G., 2026. – An approach to the taxonomy and phylogeny of Oxygastridae sensu Fleck, 2018 based on larval and imaginal morphology (Odonata: Anisoptera). *Faunitaxys*, 14(01) : 1 – 11. https://doi.org/10.57800/faunitaxys-14(01)

Coache A. & Lacroix M., 2026. – Un nouveau Sericinae de l'archipel de Sao Tomé et Principe (Coleoptera, Scarabaeoidea, Sericinae). *Faunitaxys*, 14(02) : 1 – 5. https://doi.org/10.57800/faunitaxys-14(02)

Deslisle G., 2026. – Birdwing Butterflies NOVA, Part I (Lepidoptera, Papilionidae, Troidini). *Faunitaxys*, 14(03) : 1 – 53. https://doi.org/10.57800/faunitaxys-14(03)

Fleck G., 2026. – ERRATA: An approach to the taxonomy and phylogeny of Oxygastridae *sensu* Fleck, 2018 based on larval and imaginal morphology (Odonata : Anisoptera). *Faunitaxys*, 14(04) : 1. https://doi.org/10.57800/faunitaxys-14(04)

Vives E., 2026. – Una nueva especie de *Nethinius* Fairmaire, procedente de la Isla Mauritius (Coleoptera, Cerambycidae, Disteniinae). *Faunitaxys*, 14(05) : 1 – 2. https://doi.org/10.57800/faunitaxys-14(05)

Santos-Silva A. & Devesa S., 2026. – On *Lepturgotrichona* Gilmour, 1957 (Coleoptera, Cerambycidae, Lamiinae). *Faunitaxys*, 14(06) : 1 – 8. https://doi.org/10.57800/faunitaxys-14(06)

Audibert C. & Porion T., 2026. – *Scamandra sumbaensis* **n**. **sp**. : une nouvelle espèce de Fulgoridae d'Indonésie (Hemiptera : Fulgoromorpha). *Faunitaxys*, 14(07) : 1 – 2. https://doi.org/10.57800/faunitaxys-14(07)

Sabatinelli G., Nuvoli M. T. & Cillo D., 2026. – *Polyphylla ichnusae* new species from Sardinia with notes on Mediterranean *Polyphylla* (Col. Scarabaeidae Melolonthinae Melolonthini). *Faunitaxys*, 14(08) : 1 – 16. https://doi.org/10.57800/faunitaxys-14(08)

Davenport C., Grimaldi N. & Pequin O., 2026. – A new subspecies of *Delias patrua* Leech, 1890 (Lepidoptera: Pieridae) from East Laos. *Faunitaxys*, 14(09) : 1 – 6. https://doi.org/10.57800/faunitaxys-14(09)

Dalens P.-H. & Robin F., 2026. – Un nouveau genre d'Agapanthiini de Guyane (Coleoptera, Cerambycidae, Lamiinae). *Faunitaxys*, 14(10) : 1 – 5. https://doi.org/10.57800/faunitaxys-14(10)

Lourenço W. R. & Velten J., 2026. – New considerations about the outstanding variability of the genus *Chaerilobuthus* Lourenço & Beigel, 2011 (Scorpiones: Chaerilobuthidae) and the description of one more new species from Early Cretaceous Burmite. *Faunitaxys*, 14(11): 1 – 6. https://doi.org/10.57800/faunitaxys-14(11)

Roguet J.-P., 2026. – Notes sur les Lamiinae du Panama (Coleoptera, Cerambycidae). *Faunitaxys*, 14(12) : 1 – 5. https://doi.org/10.57800/faunitaxys-14(12)

Cerda J.-A., 2026. – Ctenuchina de Guyane française (2de partie). Les genres *Leopardellus* - *Prosopidia* - *Bipartes* - *Apoheliura* - *Passineura* & *Veraneacerea* (3e article). 20e note. *Faunitaxys*, 14(13) : 1 – 16. https://doi.org/10.57800/faunitaxys-14(13)

Novák V., 2026. – *Bolbostetha luminaria* **sp**. **nov**. (Coleoptera: Tenebrionidae: Alleculinae: Alleculini), the first known species of the genus living in Laos. *Faunitaxys*, 14(14) : 1 – 4. https://doi.org/10.57800/faunitaxys-14(14)

Coache A., 2026. – Première mention de la famille des Rutelinae sur l'archipel de Sao Tomé-et-Principe et description d'une nouvelle espèce d'*Adoretus* Dejean, 1833 (Coleoptera, Scarabaeidae, Rutelinae, Adoretini). *Faunitaxys*, 14(15) : 1 – 7. https://doi.org/10.57800/faunitaxys-14(15)

Zhu Z.-H., 2026. – The genus *Acromantis* Saussure, 1870 (Mantodea: Hymenopodidae) from Laos with description of a new species based on integrated taxonomy. *Faunitaxys*, 14(16) : 1 – 11. https://doi.org/10.57800/faunitaxys-14(16)

Herbin D., 2026. – New species of *Zanola* Walker, 1855 (Part 2) (Lepidoptera: Apatelodidae). *Faunitaxys*, 14(17) : 1 – 14. https://doi.org/10.57800/faunitaxys-14(17)

Ythier E. & Lourenço W. R., 2026. – On the genus *Ananteris* Thorell, 1891 in French Guiana, with description of a new species (Scorpiones: Ananteridae). *Faunitaxys*, 14(18): 1 – 12. https://doi.org/10.57800/faunitaxys-14(18)

Háva J. & Zahradník P., 2026. – A new genus and species of Ptinidae (Coleoptera) from Eocene Baltic amber. *Faunitaxys*, 14(19): 1 – 4. https://doi.org/10.57800/faunitaxys-14(19)

Faunitaxys est échangée avec les revues suivantes (« print versions »)

– Annali del Museo Civico di Storia Naturale G. Doria (Italie)
– Boletín de la Asociación española de Entomología (Espagne)
– Boletín de la Sociedad Andaluza de Entomología (Espagne)
– Bollettino del Museo di Storia Naturale di Venezia (Italie)
– Bulletin de la Société linnéenne de Lyon (France)
– Bulletin of Insectology (Italie)
– Heteropterus Rev. Entomol. (Espagne)
– Integrative Systematics (Allemagne)
– Israel Journal of Entomology (Israel)
– Klapalekiana (République Tchèque)
– Koleopterologische Rundschau (Allemagne)
– Memorie del Museo Civico di Storia Naturale di Verona (Italie)
– Nova Supplementa Entomologica (Allemagne)
– Proceedings of the Entomological Society of Washington (USA
– Revue suisse de Zoologie (Suisse)
– Spixiana (Allemagne)
– Zoosystematica Rossica (Russie)

Faunitaxys

Volume 14, Numéro 20, Mars 2026

SOMMAIRE

Un synopsis des modèles trichobothriaux observés chez les scorpions fossiles du Crétacé inférieur. Part I : Les Buthoidea C. L. Koch, 1837 et les groupes associés.

Wilson R. Lourenço . . . . . 1 – 12

CONTENTS

A synopsis of the trichobothrial patterns observed for Cretaceous amber scorpions. Part I: Buthoidea C. L. Koch, 1837 and related groups.

Wilson R. Lourenço . . . . . 1 – 12

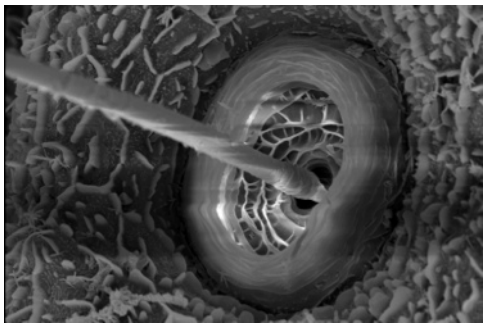


Illustration de la couverture :

Trichobothrium $\mathbf{i_1}$ of femur (x 2200); male of the extant species *Microcharmus fisheri* lourenço, 1998 (family Microcharmidae Lourenço).

Crédits:

Wilson R. Lourenço : Fig. 1-31 & couverture.

Alexander Beigel : Fig. 32-33.

Publié par l'Association Française de Cartographie de la Faune et de la Flore (AFCFF)